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CENTRAL INTELLIGENCE AGENCY

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COUNTRY	USSR(Moscow Oblast)/Germany(SovZone)	REPORT	
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THIS IS UNEVALUATED INFORMATION

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Tolerances

1. At NII-160, Fryazino, tolerances of tools and dies, including pressings, punchings, drawn cylinders and membranes, as well as parts for television and picture tubes were from 0.002 to 0.005 millimeter. The magnetron slit tolerance was 0.02 millimeter. Ordinary receiving tube parts were also plus or minus 0.02 millimeter. These are the only tolerances which source recalls.

Production Difficulties

2.

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and other equipment the quality of the lathes in the tool and die making section was quite satisfactory.

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2. Description of Tool Making Shop at NII-160

3. In order to show clearly the location of the tool making shop at NII-160, [redacted] the sketch shown in Figure 1 below depicting the layout of the entire institute and has also described briefly the function of each building. 50X1-HUM

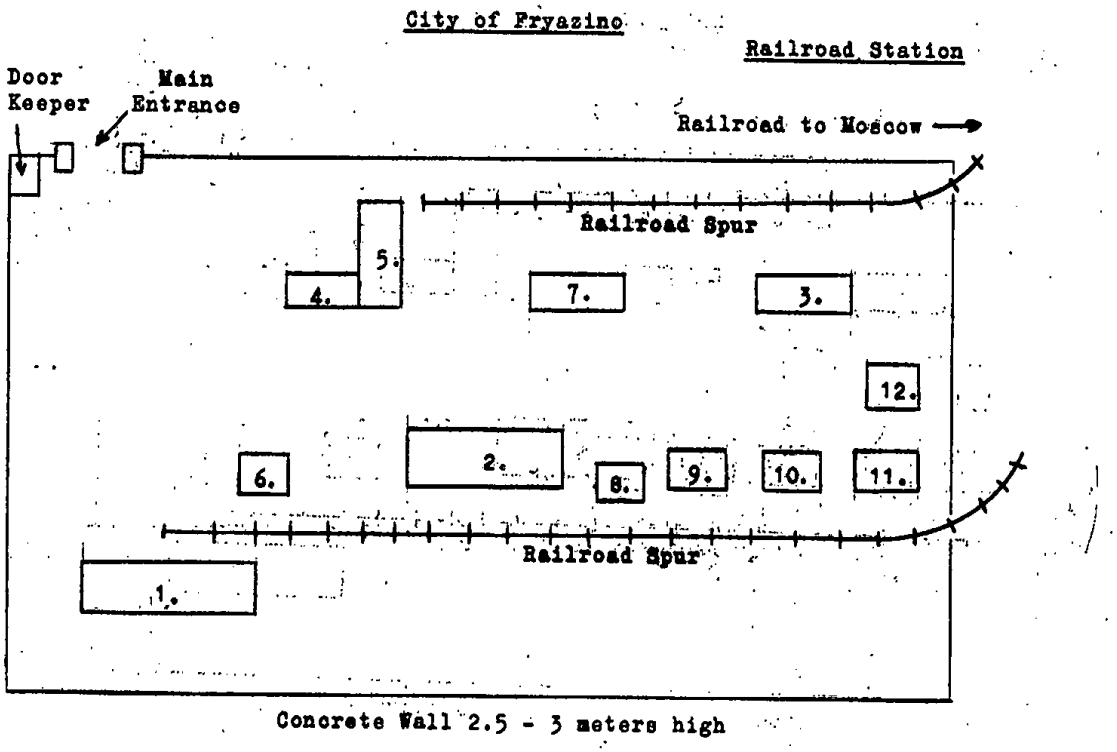

Figure 1, Layout of NII-160

4. Description of Buildings Shown in Fig. 1:

Building 1 (Plant): Shipping dept., storehouse, workshop, stamping and pressing shop, grind winding shop, tube assembly room, work planning department.

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Building 2 (Institute):	Ground floor: experimental workshops for magnetrons and metallurgy;
	Second floor: drafting rooms, administrative offices, political leader's office, conference hall, buffet, file room, and laboratories for centimeter technology (measuring lines), picture tubes, and chemistry.
Building 3:	Ground floor: smithy, mechanical workshop, welding shop, machine and furnace construction (sic), precision drilling shop;
	Second floor: tool making shop. See Figure 2 and following paragraphs below.
Building 4:	Canteen
Building 5:	Tube plant (iconoscopes)
Building 6:	School
Building 7:	Glass plant
Building 8:	Machine house
Buildings 9, 10, and 11:	Newly built buildings for tube assembly
Building 12:	Still under construction in 1950, purpose not known to source.

5. Sketch of second floor of Building 3

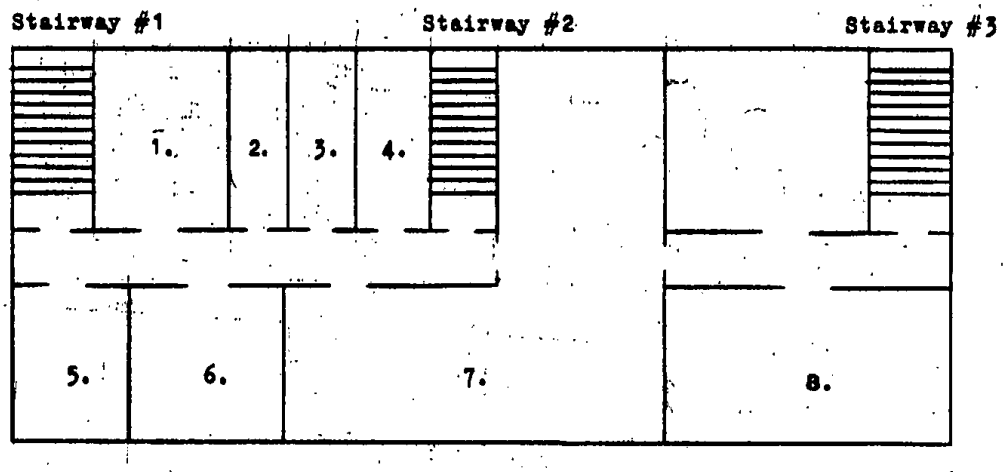

Figure 2

6. Layout of second floor of Building 3

Room 1: Hardening and grinding shop (cylindrical and surface grinding equipment).

Room 2: Work preparation office.

Room 3: Chief engineer's office.

Room 4: Parts inspection office.

Room 5: Steel supply room.

Room 6: Planing, milling, and turning shop.

Room 7: Tool construction and assembly shop.

Room 8: Design office and drafting room.

7. Operations of Tool Making Shop

For the construction of a new tool, the work preparation office received all design specifications and calculations for each individual component. The tool was then drawn in detail in the drafting office, and the overall design was given parts numbers and parts lists. This was done by the chief tool designer in the office of Anurov (source's phonetic spelling) in Building 2. Anurov was a very well qualified man with considerable experience in the field of punch press operations. Every part of the new tool was then drawn individually by technical draftswomen on separate sheets of drawing paper (mostly DIN Format A 5/3), at which time working symbols were added such as tolerances, Rockwell hardness specifications, etc. Each individual component down to the smallest pin or screw was drawn separately. The chief engineer then distributed the various drawings and the corresponding raw materials to the proper workers (planer, miller, or lathe operators, for example). In this way the parts were produced separately from each other. When completed the parts were passed to the inspection office, and when approved they were delivered to the tool construction and assembly shop for final assembly. If the inspection office detected deviations from specifications the defective part was rejected and had to be produced from the beginning again. Parts were often produced two or three times before the specified tolerances were reached. Inasmuch as the workers seldom bothered themselves as to the function of the parts they worked on, those parts which were slightly off-tolerance could never be saved by a corresponding change in the dimensions of another component. If the tolerance for a certain piece were as little as a fraction of a hundredth of a millimeter that piece did not leave the parts inspection office unless the tolerance was exactly met. Optical measuring methods were used by this office.

8. The tool makers assembled the parts according to the designs, and it was often apparent that they did not completely understand the function of the tools, and therefore were not able to do this assembly work with the necessary finesse such as consideration of freedom of movement of moving parts. The completed tools usually had to be given to the German tool makers for additional work before they could be used in production. It should be noted here that the Germans were paid by the hour whereas the Soviets were paid by the piece, and the Soviet's principal interest was in earning as much money as possible because the rate per piece was always quite low. This undoubtedly contributed to the Soviets' carelessness and lack of detail in their work.

9. In the years 1948 to 1950 many young men were hired at NII-160 as tool makers. There was, however, no apprentice training as practiced in Germany, but the young men were rather paid from the beginning of their employment according to their output. They were not very good. However, some of the tool makers had received their training in large enterprises in Moscow and were excellent workers who produced large outputs. For example, next to source's desk worked a designer from Moscow who compared favorably, in source's opinion, with tool designers in the West.

10. A total of approximately 50 tool makers were employed in the tool construction and assembly shop. In the planing, milling, and turning shop there were 70 to 80 machine tools. The grinding shop had four cylindrical grinders and three surface grinders. There were many tools for repeated operations built into the automatic stamping and punching machines. There were also copies of American Bayrd machines. These machines were characterized by four shafts in a horizontal arrangement which were connected together synchronously by conical gear wheels. On the shafts were mounted divided curved disks which actuated the sliders. Strips of sheet metal were fed with automatic drive on edge through the machine, while the tool punched, stamped, bent, folded to remove the burr, and then cut and stripped them in successive stages controlled by the curved disks.

11. Stamping and punching tools were usually constructed with a vertical movement regardless of whether or not they were to be used as pressure tools (stamping) or drawing (for small extensions) and whether or not they were to be used for a single operation or for multiple operations. The tools were fitted with cast iron plates in hardened steel casings to guide the vertical movement. Both plates (the upper and the lower) were bored and ground to the same diameter. As shown by Figure 3 below, oil grooves were ground into the vertical guide columns.

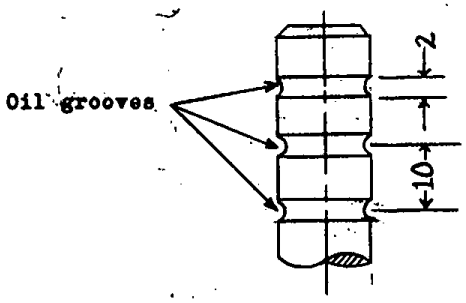

Figure 3

Brigade System at NII-160

12. The brigade system was used in all sections of NII-160. The Soviet workers were indoctrinated with the idea of bringing socialism to the entire world through greater production. Large meetings were held for the workers every 14 days for the purpose of exciting enthusiasm for this goal.

Tube Producing Machinery at NII-160

13. There were 10 Bruekner grid winding machines and 20 American machines at Fryazino. By means of the latter, the grid was wound into slits on the supports, and the slits were then pressed together to hold the grid wires in place. The anode making machines at NII-160 were of American manufacture (Beard, types 0-0, 1-1, and 2-2, the last of which was being copied in Moscow). The Soviets also copied four-spindle machines. Six or seven of these were delivered a short time before source's departure. The bearings in these machines were good, but the tolerances of the various driving arms were very poor, and necessitated rebuilding by the Germans. Adequate supplies of good quality raw material for rebuilding were always available. However, the Germans had difficulties with the round and flat stock metals. These were frequently of irregular dimensions - the dimensions of square and rectangular bar stock sometimes were so irregular that some pieces were unusable.

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15. The quality of the handwork which source observed while at Werk HF was quite good. the quality of overall production was quite poor when compared to production in Western Germany. Communist Party members rather than technically trained personnel were placed in executive positions.

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16. Three of the four grid winding machines at Werk HF had been produced at Telefunken in 1944. the plant expected to build four for its own use. The vacuum tube laboratory was equipped with 30 small Telefunken machines that were used for making sample tubes and small production runs. Roehrenwerk Erfurt had about 10 such machines. Heim was the designer of these machines These machines were quite slow, with a maximum speed of 500 revolutions per minute.

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